



# **CHROMOPHARE®**

## **C 572, C 571, C 452, C 450**

Mounting and Operating Instructions

Wall lights

*Berchtold.  
Wir helfen*

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## 1. GENERAL

### 1.1 Introduction

The CHROMOPHARE® C 572, C 571, C 452 and C 450 consists of a wall bracket, a swivel arm support, a lamp housing.

The lamp housing is fixed to a cardanic-type support (horizontal gimbal joint) and can be rotated, swiveled and tilted in any direction. The height is adjusted via the 360° rotating vertical spring arm. The spatial position of the lamp is adjusted by means of the 180° rotating horizontal swivel arm.

The special features of the CHROMOPHARE® C generation are:

- Cool light in the surgical area and in the beam path of the operating lights, which is achieved by filtering out the infrared proportion by means of the proven ThermoSorb® double filter system.
- The suspension and the hand grip ensure a high degree of hygiene.

Additional special features of the CHROMOPHARE® C 572

- High illuminance of 135.000 lux for illuminating a deep surgical area, which is achieved with the assistance of the newly developed polygon reflector with its mirror-like surface.
- Excellent depth of illumination and low shadow levels, which are achieved by modifying the light beam using 720 reflector elements..

Additional special features of the CHROMOPHARE® C 571

- High illuminance of 100.000 lux for illuminating a deep surgical area, which is achieved with the assistance of the newly developed polygon reflector with its mirror-like surface.
- Excellent depth of illumination and low shadow levels, which are achieved by modifying the light beam using 720 reflector elements..

Additional special features of the CHROMOPHARE® C 452

- High illuminance of 85.000 lux for illuminating a deep surgical area, which is achieved with the assistance of the newly developed polygon reflector with its mirror-like surface.
- Excellent depth of illumination and low shadow levels, which are achieved by modifying the light beam using 576 reflector elements..

Additional special features of the CHROMOPHARE® C 450

- High illuminance of 55.000 lux for illuminating a deep surgical area, which is achieved with the assistance of the newly developed polygon reflector with its mirror-like surface.
- Excellent depth of illumination and low shadow levels, which are achieved by modifying the light beam using 576 reflector elements..

## 1.2 Manufacturer's notes

The manufacturer of the products specified in the user's manual is

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Ludwigstaler Straße 25  
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D-78505 Tuttlingen  
Internet: [www.BERCHTOLD.de](http://www.BERCHTOLD.de)  
e-mail: [Info@BERCHTOLD.de](mailto:Info@BERCHTOLD.de)  
Tel. (+49) 7461 / 181-0  
Fax (+49) 7461 / 181-200

## 1.3 General information

- This operating instructions is considered part of the equipment. It must be kept in the vicinity of the equipment at all times. Precise observance of the operating instructions is a prerequisite for the proper use and correct operation of the equipment, which is essential for the safety of patients and operators alike.
- Only accessories which are specified in this user's manual, and which have been tested together with the equipment, may be used. If accessories are used which are not specified in the user's manual, their ability to be used in accordance with safety regulations must be proved.
- All literature relates to the equipment model and the prevailing basic safety regulations when printed. All rights are reserved for equipment, switches, procedures, software programs and names.

## 1.4 Information about product liability

BERCHTOLD considers itself responsible for the consequences of safety, reliability and performance of the equipment only if:

- a) installation, modifications or repairs have been performed only by BERCHTOLD, or by an agent expressly authorized by BERCHTOLD to do so,
- b) the electrical installation of the room complies with regulations IEC 60364-710,
- c) the equipment is used in accordance with the operating instruction.

## 1.5 Receiving inspection

Please inspect the equipment and accessories immediately after receipt for any transportation damage and defects.

Claims for damage will only be valid if the vendor (BERCHTOLD) or the carrier are informed at once. A damage report must then be prepared immediately. The damage record must be submitted to the nearest BERCHTOLD representative or to BERCHTOLD directly.

When an appliance or parts of an appliance are returned to BERCHTOLD or to a BERCHTOLD service agent, the original packaging should be used where possible. The following accompanying documentation must be attached: owner's name and address, equipment number (see type plate), description of the defect.

## 1.6 EC Certification

The equipment complies with the requirements of the EC guideline regarding medical products, 93/42/EEC as well as the UL guidelines.

## **2. BEFORE OPERATING**

### **2.1 Range of application (purpose)**

The CHROMOPHARE® light is a medical light for use in hospital treatment rooms. It is used for the local illumination of the patient's body, so that illnesses, injuries and handicaps can be recognized and treated. It may only be used in rooms which have been correctly designed out in accordance with IEC 60364-710.

The CHROMOPHARE® light as a single light provides a very high degree of failure protection, as it is equipped with automatic switch-over to a reserve lamp, electronic monitoring with a "bypass switch" and an automatic APU switch-over. However, not all components are duplicated, so that in some circumstances a failure is still possible. As a matter of principle, single lights should not be used for operations where a light failure could represent a great danger to the patient.

### **2.2 Safety informations / cautions**

- Incorrect operation and non-observance of safety measures can cause serious incidents. Therefore make sure that you have read and understood the information in your CHROMOPHARE® operating instructions.
- The light is not intended for operation in areas where there is danger of explosion.
- Do not look into the switched-on light from the front and do not put any reflective objects into the path of the beam. Because of the high illumination strength there is a danger of glare.
- The distance between the light emission surface area of the operating light and the patient surface should not be less than 60 cm in order to ensure proper illumination.
- The light must not be operated if the cover glass or the filter system is damaged or destroyed. Thermal radiation can reach the surgical area, heating up and drying out the tissue of the operation wound. If the effect is prolonged, there is even the danger of tissue necrosis.
- Do not place any objects on the lamp housing or hang objects on arms or lamp housings, as this may compromise the stability of the fixing and there is the danger that these objects may fall into the surgical area. Attaching or hanging heavy objects can destroy the mechanism.
- The lamp housing must not be covered while in operation, as this prevents heat exchange with the environment and could cause the surgical light to overheat.
- Collision of the supporting arms and lamp housings should to be avoided. A severe collision could result in lights being damaged or parts knocked off and falling into the surgical area.

### **2.3 Installation instructions**

Mounting and installation of CHROMOPHARE® light or the combination lights must be in accordance with BERCHTOLD's "Mounting instructions" and must only be performed by BERCHTOLD employees or by installation companies authorized by BERCHTOLD. The installation of lights on the ceiling of the operating room must be performed in accordance with BERCHTOLD's "Ceiling anchor plate and spacer block" mounting instructions due to weight and high torque.

Incorrect assembly of the lights can result in ceiling anchorage damage off and falling down, critically injuring the patient and operating staff in the process. The on-site electric installation must be performed in accordance with IEC 60364-710 and include a fuse protection as well as a mains switch for a simultaneous all-pole separation of the light. For further information, please note the mounting instructions.

## 2.4 Instructions for initial start-up

The operator may begin to use the light, after the manufacturer or supplier

- a) has carried out a performance check at the place of operation,
- b) has introduced those responsible for the operation of the light to its correct handling by means of the operating instructions.

## 2.5 Visual and performance check

Before initial start-up the manufacturer or supplier should check that the CHROMOPHARE® light has been properly installed and is in a safe and operational condition.

A visual inspection of the following points must take place:

- After switching-on the unit, light must be emitted from the lamp.
- Inspection of the light emission lens of the lamp housing.  
If the light emission lens is damaged or broken, glass splinters can fall out. The light must be switched off immediately and must not be used until the defect has been rectified.
- Inspection of the reserve lamp warning indicator.  
In the case of failure of the main lamp, the reserve lamp is automatically switched on. The red warning indicator on the control panel illuminates to indicate this error. The defective main lamp should be replaced as soon as possible.
- Checking the operational state of the control panel.  
The individual functions must be checked by activating the appropriate keys.
- Checking the movement mechanism for perfect operation.  
The mechanical operation of the lights is checked by swiveling and rotating the movement mechanism.

## 2.6 Cleaning, sterilization, disinfection

- All parts of the CHROMOPHARE® light can be cleaned with standard commercial cleaners on all exterior surfaces including the control unit, and disinfected with the disinfectants normally used in surgical areas.
- Cleaning, disinfectant and sterilization of the sterilizable handles.  
The sterilizable handles are made of heat-proof, impact-resistant plastic. They can be cleaned with mild alkaline cleaners without active chlorine. The cleaners must be thoroughly rinsed off with water. Alternatively, the hand-grip holders can be cleaned mechanically with heat-sterilisation up to a maximum temperature of 93°C/10 min.

For disinfecting the handle sleeves we recommend products with an alcohol or aldehyde base. The sleeves must be rinsed before sterilization.

The handles can be sterilized in steam. The recommended parameters are:

1. Steam sterilization at 121° C; 1.3 bar; 25 to 30 minutes
2. Steam sterilization at 134° C; 2.3 bar; 4 minutes

When filling the autoclave ensure that the open side of the handles are face down. The sleeves must lie free and must not come into contact with any other items being sterilized.

- Hot-air sterilization is not recommended by BERCHTOLD. However, if it is necessary, the handles should be sterilized loose at 134° C; 3 minutes.
- Damaged grip sleeves must not continue to be used.


*Note: Sterilizable handles are subject to natural wear. As a rule, a life of approx. 100 cleaning cycles is normal.*



### 3. TECHNICAL DATA


#### 3.1 CHROMOPHARE® C 572 and C 571

Light technical data	C 571		C 572	
Reflector system	Polygonreflector			
Colour temperature	4500 K	3600 K	4500 K	3600 K
Intensity Ec at 1 m [klx]	100	120	135	165
Intensity control [klx]	45 - 100	55 - 120	60 - 135	75 - 165
Total radiant power at max intensity	370 W/m²	447 W/m²	500 W/m²	615 W/m²
Total radiant power/intensity Ec [mW/m²lux	3,7			
Colour rendering index Ra	94			
Light field diameter	18 - 28 cm		17 - 24 cm	
Light field dia. at 10% of max intensity	18 cm		17 cm	
Light field dia. at 50% of max intensity	9 cm		8,5 cm	
Remaining illuminance when beam is obstructed by one mask	26%		24%	
Remaining illuminance when beam is obstructed by two mask	45%		45%	
Remaining illuminance inside at the bottom of a standardised tube.	100%		100%	
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by one mask	26%		24%	
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by two mask	45%		45%	
Depht of illumination L1 + L2	130 cm		130 cm	
Electrical data				
Prim. A.C. voltage of transforme	110 / 120 / 130 V A.C. 220 / 230 / 240 V A.C.			
Power consumption	250 VA or 190 VA at 28 V D.C.			
Transformer – rated capacity	250 VA / 50/60 Hz			
Safety Category	1			
Protection provided by enclosure	IP 53			
Ceneral data				
Halogen bulb Order no.	24 V / 150 W CZ 908-24			
Life time of halogen bulb	1000 h			
Autom. switch over to reserve bulb	yes			

<b>Dimensions</b>	<b>Classic cardanic</b>	<b>Flat cardanic</b>
Diameter of light body	57 cm	
Diameter of polygonreflectors Polygon Reflectors	50 cm	
Light emission surface (glass surface)	2092 cm <sup>2</sup>	
Max. swivel radius	220 cm	211 cm
Lowest position of light body	978 cm	128 cm
Highest position of light body	208 cm	224 cm
Clearance	206 cm at 270 cm finished ceiling	200 cm at 250 cm finished ceiling
<b>Weight / Torque</b>		
Weight incl. transformer	27 kg	
Max. torque	291 Nm	
<b>Certifikate</b>	 conform with 93/43 EEC UL listed	

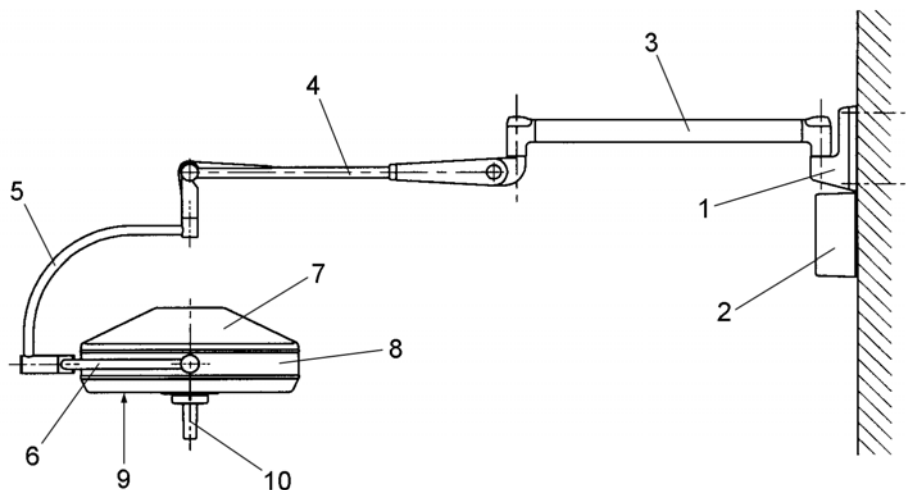
### 3.2 CHROMOPHARE® C 452 and C 450

Light technical data	C 450		C 452	
Reflector system	Polygonreflector			
Colour temperature	4500 K	3600 K	4500 K	3600 K
Intensity Ec at 1 m [klx]	55	70	85	105
Intensity control [klx]	no	no	no	no
Total radiant power at max intensity	205 W/m²	261 W/m²	317 W/m²	391 W/m²
Total radiant power/intensity Ec [mW/m²lux	3,7			
Colour rendering index Ra	94			
Light field diameter	16,5 - 22 cm		15 - 21 cm	
Light field dia. at 10% of max intensity	16,5 cm		15 cm	
Light field dia. at 50% of max intensity	8,5 cm		8 cm	
Remaining illuminance when beam is obstructed by two mask	not applicable		not applicable	
Remaining illuminance when beam is obstructed by one mask	45%		43%	
Remaining illuminance inside at the bottom of a standardised tube.	100%		100%	
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by one mask	not applicable		not applicable	
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by two mask	45%		43%	
Depht of illumination L1 + L2	160 cm		170 cm	
Electrical data				
Prim. A.C. voltage of transforme	110 / 120 / 130 V A.C. 220 / 230 / 240 V A.C.			
Power consumption	140 VA or 110 VA at 26,5 V D.C.			
Transformer – rated capacity	140 VA / 50/60 Hz			
Safety Category	1			
Protection provided by enclosure	IP 53			
Ceneral data				
Halogen bulb Order no.	22,8 V / 110 W CZ 905-22			
Life time of halogen bulb	1000 h			
Autom. switch over to reserve bulb	yes			

Dimensions	Classic cardanic	Flat cardanic
Diameter of light body	45 cm	
Diameter of Polygon Reflectors	41 cm	
Light emission surface (glass surface)	1240 cm <sup>2</sup>	
Max. swivel radius	211 cm	204 cm
Lowest position of light body	105 cm	129 cm
Highest position of light body	218 cm	226 cm
Clearance	206 cm at 270 cm finished ceiling	200 cm at 245 cm finished ceiling
<b>Weight / Torque</b>		
Weight incl. transformer	23 kg	
Max. torque	228 Nm	
<b>Certifikate</b>	 EC conform with 93/43 EEC UL listed	

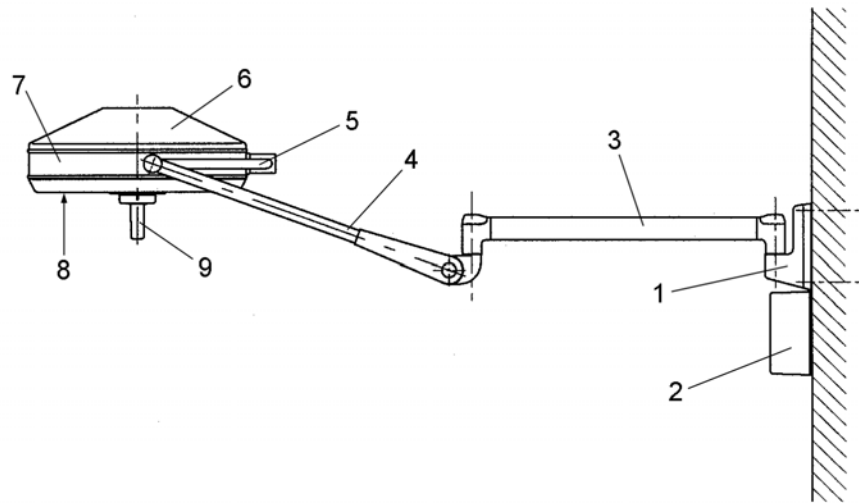
## 4. COMPONENTS

### 4.1 CHROMOPHARE® C 572 and C 751 (classic cardanik)



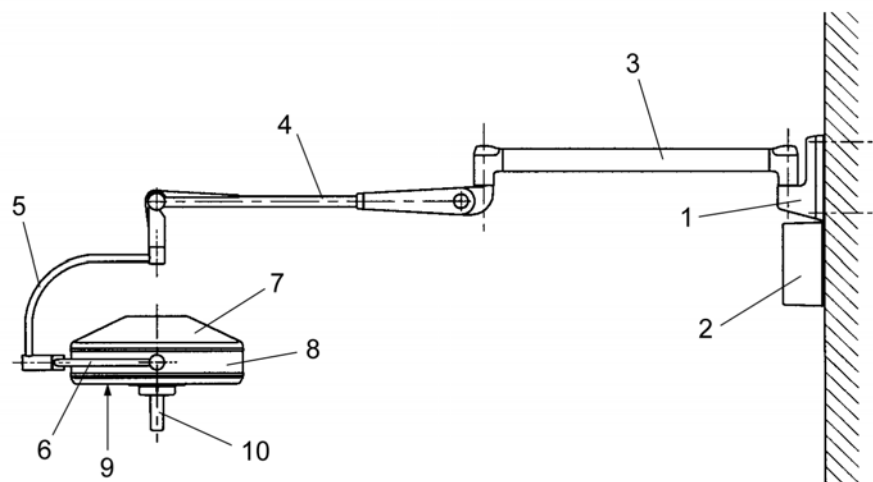
- 1 Wall suspension
- 2 Transformer
- 3 Horizontal swivel arm
- 4 Vertical spring arm
- 5 Vertical gimbal joint
- 6 Horizontal gimbal joint
- 7 Lamp housing hood
- 8 Lamp frame
- 9 Light emission lens
- 10 Sterilizable handle

#### 4.2 CHROMOPHARE® C 572 and C 571 (flat cardanic)



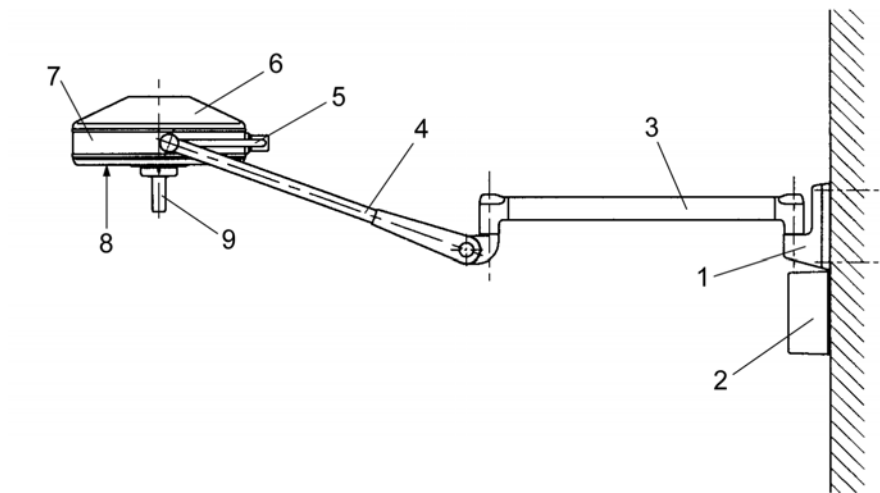
- 1 Wall suspension
- 2 Transformer
- 3 Horizontal swivel arm
- 4 Vertical spring arm
- 5 Cardan joint
- 6 Lamp housing hood
- 7 Lamp frame
- 8 Light emission lens
- 9 Sterilizable handle

#### 4.3 CHROMOPHARE® C 452 and C 450 (classic cardanic)



- 1 Wall suspension
- 2 Transformer
- 3 Horizontal swivel arm
- 4 Vertical spring arm
- 5 Vertical gimbal joint
- 6 Horizontal gimbal joint
- 7 Lamp housing hood
- 8 Lamp frame
- 9 Light emission lens
- 10 Sterilizable handle

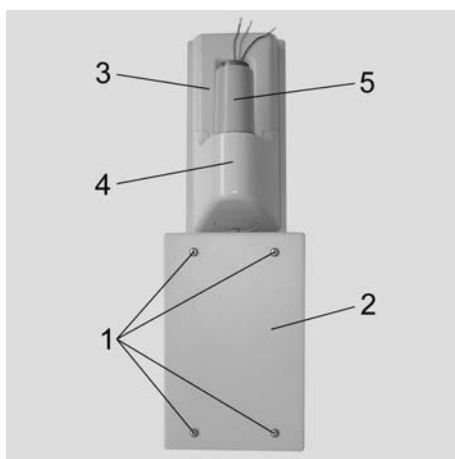
#### 4.4 CHROMOPHARE® C 452 and C 450 (flat cardanik)



- 1 Wall suspension
- 2 Transformer
- 3 Horizontal swivel arm
- 4 Vertical spring arm
- 5 Cardan joint
- 6 Lamp housing hood
- 7 Lamp frame
- 8 Light emission lens
- 9 Sterilizable handle

## 5. MONTAGEANWEISUNG

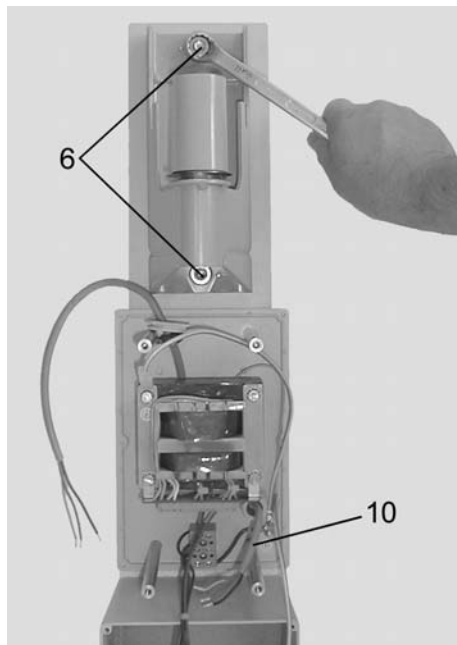
### 5.1 Wall bracket CHROMOPHARE® C-generation



Das Wandlager wird wie nebenstehend abgebildet mit der Leuchte geliefert.

Zur Montage sind in folgenden Teile vom Wandlager zu entfernen:

- 1 Screws
- 2 Cover für Transformer
- 3 Cover for bearing
- 4 Cover for bearing
- 5 Protection sleeve



The wall bracket is to be fastened by means of 2 dowels (6).

The wall bracket has, besides the 2 holes with diameter 11 mm, for dowels M10 and a bolting for passing the mains supply cable (10).

**For installing a wall bracket with a dowel, a so-called „individual approval“ from the relevant regional building authority is essential.**

The wall bracket for CHROMOPHARE® C-generation must be secured with the following dowels.

#### **Concrete Wall:**

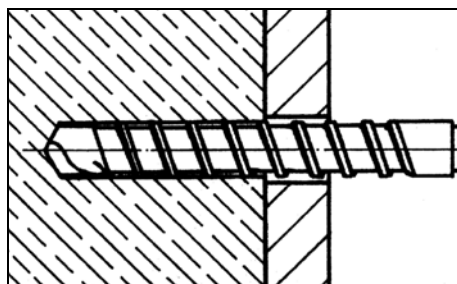
Dowel type: Through-anchor (Hilti HST M10/10)  
 Hole diameter: 10 mm  
 Drilling depth: 80 mm

These Through-anchors can be used under the following general structural engineering conditions:

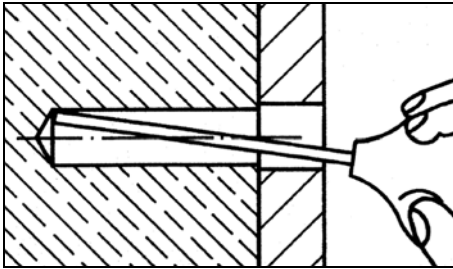
- Concrete property class  $\geq$  B 25
- Ceiling thickness  $\geq$  12 cm
- Edge distance to the next ceiling opening  $\geq$  15cm

#### **Mounting instruction:**

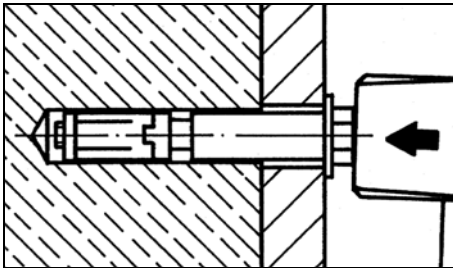
Mark one of the 2 mounting holes at the proper point on the ceiling for mounting point.



Bore the first hole according to the diameter of the through-anchor with 10 mm drill diameter and 80 mm drill depth.

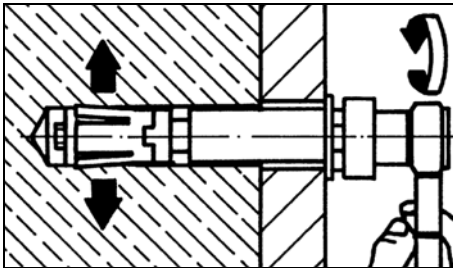


Remove boring dust and drillings from the hole with a bellow.



Hammer the through-anchor flush with the surface.

**Attention!**  
Observe the minimum insertion depth



Expand the through-anchor by using a hexagon wrench 13 mm to apply the prescribed tightening torque. Pressure can be applied to the through-anchor immediately.

**Attention!**  
Be sure to observe the prescribed tightening torque  
Mo 45 Nm.

Drill the other mounting hole (wall bracket serves as the drilling guide plate), and insert the through-anchor as described before.

After an hour the through-anchor have to be tightened again with the specified torque.

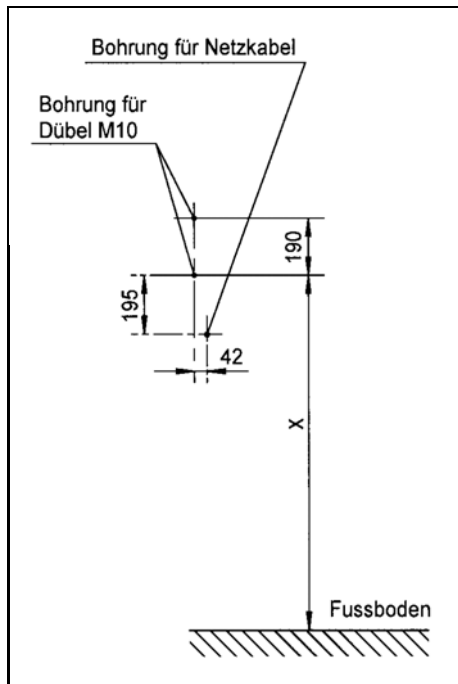
### Cellular brick, hollow bloc etc.

Dowel type:	Anchor bar (UPM-A M 10x095) with perforated sleeve (UPAT UPM-SH 16/075 M) and chemical mortar (UPAT UPM 1)
Hole diameter:	16 mm
Drilling depth:	90 mm

The following tools are necessary for mounting:

- Hammer drill, e.g. Hilti TE 52
- Bellow
- torque key to tighten the anchor





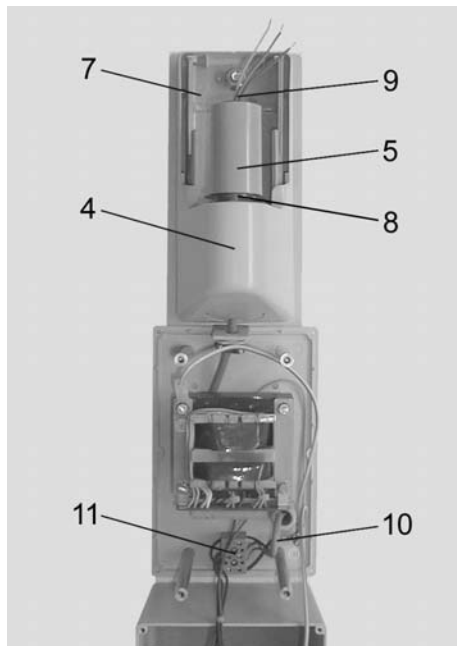
The distance (X) from the hole to the floor should be:

CHROMOPHARE® C-generation (classic cardanic) X = 206 cm

CHROMOPHARE® C-generation (flat cardanic) X = 200 cm

It is to be guaranteed that the minimum constructional requirements for a torque of  $M_t = 300 \text{ Nm}$  are given.

Concerning the different kinds of fasteners see under chapter 5.1.



Push connecting cable (9) through the bearing cover (4) and the bearing journal (8).

Push and latch the bearing cover (4) onto the bearing frame (7).

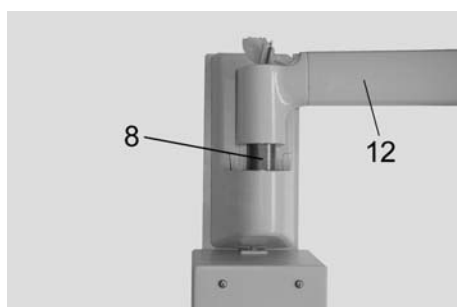
Connect the mains cable (10) L, N, and PE to the connecting terminal (11).

Latch the bearing cover (3), see picture page 14.

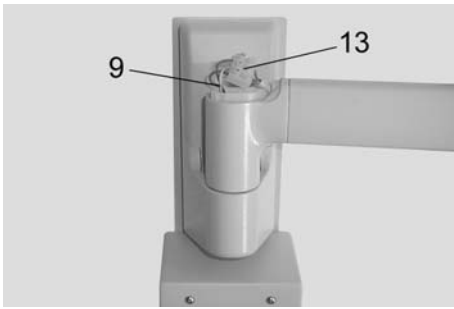
Close the transformer with the cover (2) and fasten it with four screws (1).

Take down the protection sleeve (5) from the bearing journal (8).

## 5.2 Wall arm CHROMOPHARE® C-generation



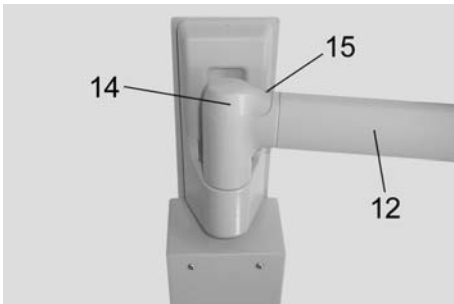
Slide wall arm (12) at the wall bracket (8).



Connect cable (9) to the connecting terminal (13).

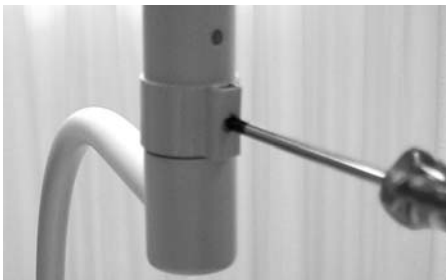
**Attention !**

Connect the green/yellow cable with each other as well as the brown with the brown one and the blue with the blue one.



Push the cover (15) onto the wall arm (12) and fasten it with the screw (14).

### 5.3 Light head CHROMOPHARE® C-generation (classic cardanik)



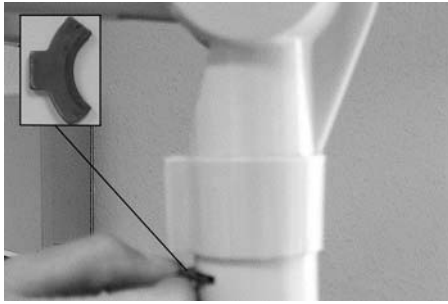
Unscrew the screw on the safety bush.



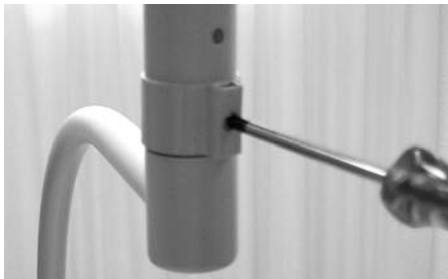
Unscrew the spring of the safety bush. Push the bush upwards, take out the segment and remove the safety screw.



Connect the pivots of the light clamp to the spring-balanced support arm until the pilot groove becomes visible.



Insert the safety segment:  
Push down the safety bush until it locks into place.



Screw in the safety screw.



Unscrew the locking bracket.

**Attention:**

**The light must be hung in place, or the spring-balanced support arm bounces up due to lack of dead weight.**

#### 5.4 Light head CHROMOPHARE® C-generation (flat cardanik)



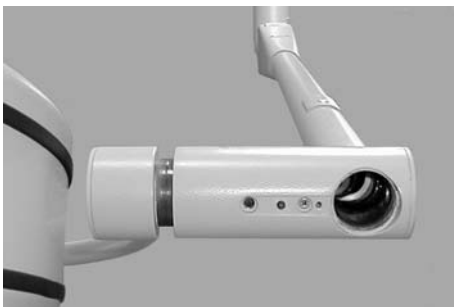
Remove screw (2) with Phillips screwdriver and take away the cover (1).



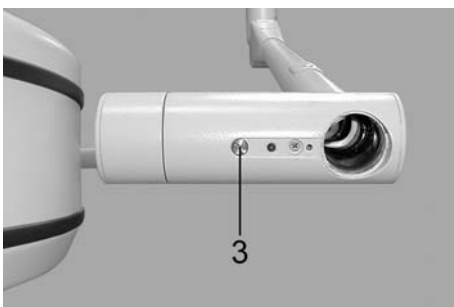
Loosen the brake screw (4) Allen key 2,5 mm.



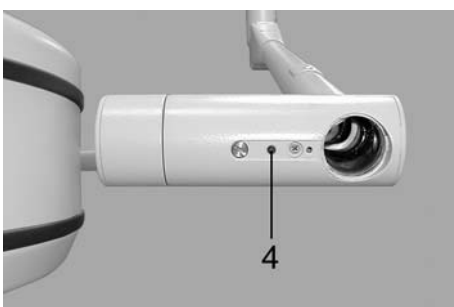
Loosen the locking location screw (3).



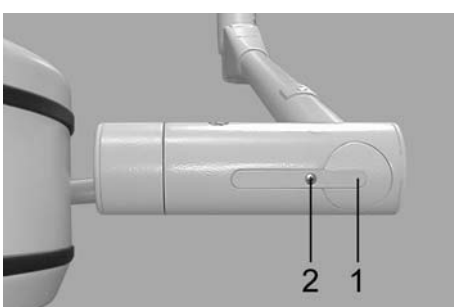
Then insert the light head into the spring balanced arm.



Now insert the locking locating screw (3) into the appropriate hole and tighten.



Insert the brake screw (4) and adjust it so the light head can be moved easily but remains in any requested position.



Insert the cover (1) and turn in the fixing screw (2) with the Phillips screwdriver.

## 6. BRAKE ADJUSTMENTS

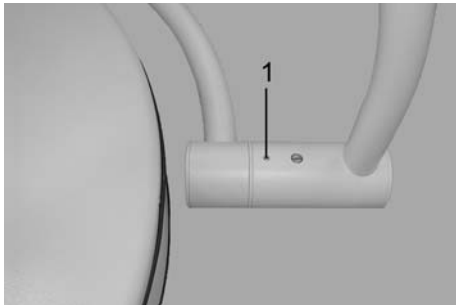
### 6.1 Light head



The mobility of the light head can be adjusted with the brake screw.  
(Allen key 3 mm)

- + ⇨ Clockwise increase friction
- ⇨ Counter Clockwise decrease friction

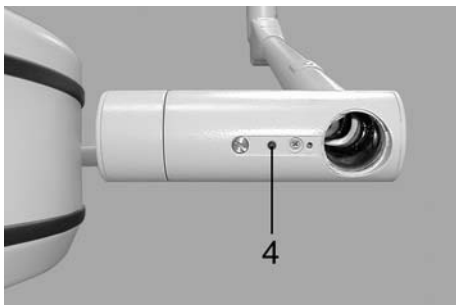
### 6.2 Cardan joint (classic cardanic)



The mobility of the cardan joint can be adjusted with the brake screw.  
(Allen key 3 mm)

- + ⇨ Clockwise increase friction
- ⇨ Counter Clockwise decrease friction

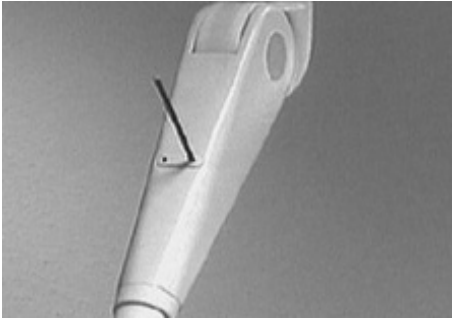
### 6.3 Cardan joint (flat cardanic)



The mobility of the cardan joint can be adjusted with the brake screw (4).  
(Allen key 2,5 mm)

- + ⇨ Clockwise increase friction
- ⇨ Counter Clockwise decrease friction

## 7. ADJUSTMENT OF THE HEIGHT MOVEMENT ON THE SPRING-BALANCE ARM



The spring-balanced support arm can be adjusted to a horizontal position on a low ceiling.

Remove the cap.



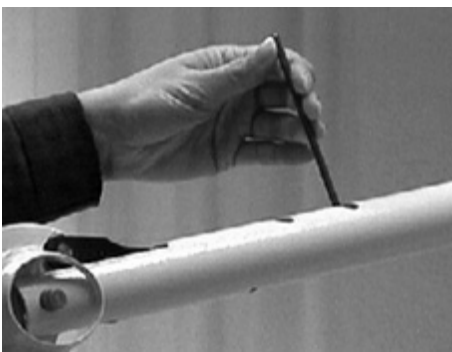
Adjust the arm until the round nut in the groove becomes visible. Turn to the desired adjustment with a  $\varnothing$  4 mm steel pin.

## 8. ADJUSTMENT OF THE WEIGHT COMPENSATION ON THE SPRING-BALANCE ARM

### 8.1 Classic cardanic



By pulling the round side caps slightly apart the main covering hull can be lifted off of the spring arm.



Move the acrobat arm upward or downward as far as the circular nut becomes visible in one of the two windows.

#### Adjustment:

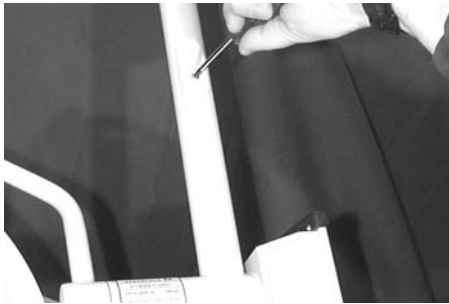
##### Light head drifts upward too easily:

Turn this circular nut with a steel pin, diameter 4 mm, in the direction of the minus symbol.

##### Light head moves downward:

Turn the circular nut in the direction of the plus symbol.

## 8.2 Flat cardanic



Remove the cover plate by using a Phillips screw driver.



Move the acrobat arm upward or downward as far as the circular nut becomes visible in one of the two windows.

### Adjustment:

#### Light head drifts upward too easily:

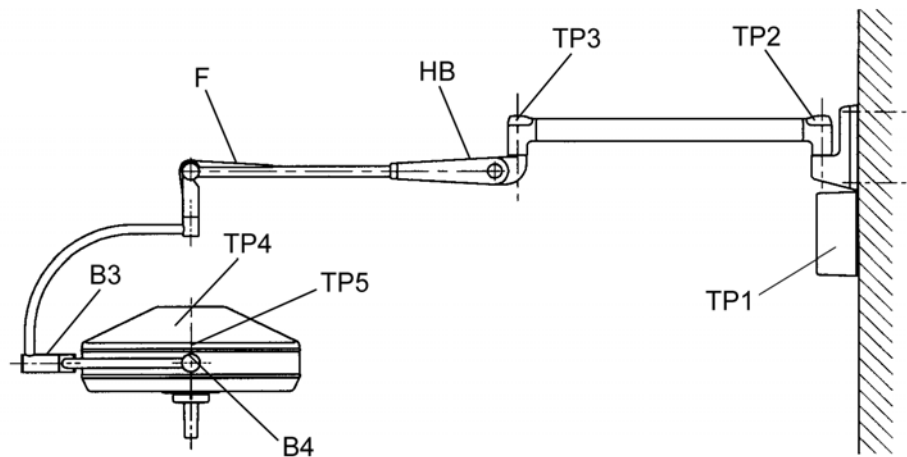
Turn this circular nut with a steel pin, diameter 4 mm, in the direction of the minus symbol.

#### Light head moves downward:

Turn the circular nut in the direction of the plus symbol.

## 9. CHECK AND ADJUSTMENT POINTS

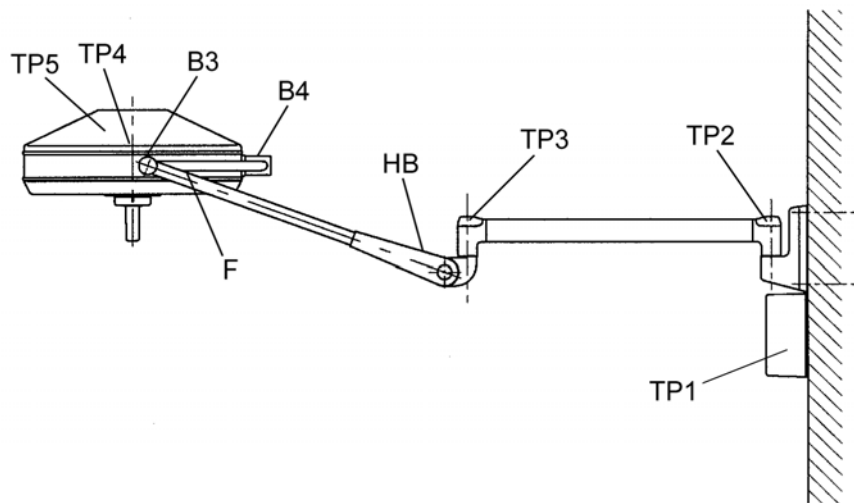
### 9.1 CHROMOPHARE® C 572 and C 571 (classic cardanic)



B Brake screw  
TP Check points, see page 23

F Spring adjustment, see page 21  
HB Height movement, see page 21

## 9.2 CHROMOPHARE® C 572 and C 571 (flat cardanic)



B Brake screw

TP Check points, see page 23

F Spring adjustment, see page 21

HB Height movement, see page 21

## 9.3 Check points CHROMOPHARE® C 572 and C 571

**TP1** Terminal block transformer  
26,5 V A.C. with load

**TP2** Terminal block  
26,1 V A.C. with load

**TP3** Sliding contact  
28,3 V A.C. without load

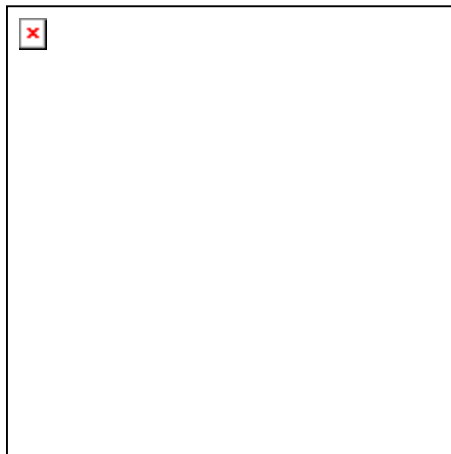
**TP4** Plug connection light intensity control board  
Pin 5 - 6 25,5 V A.C. with load  
Pin 1 - 2 27,0 V D.C. with load

**TP5** main bulb (see page 24)  
between pin 1 and 2  
max. 23,75 V A.C. / D.C. RMS  
Setting of the max. bulb voltage see page 42,  
by means of adjustable resistor R 1

reserve bulb (see page 24)  
between pin 2 and 3  
max. 23,75 V A.C. / D.C. RMS  
no trimming



#### 9.4 CHROMOPHARE® C 572 and C 571 localisation of the check point TP4 for measuring the bulb voltage



Pin 1 - 2 Main bulb

Pin 2 - 3 Reserve bulb

A Rectifier

B Fixation with load

C Load resistor

D Control board

E Light intensity control board

#### 9.5 CHROMOPHARE® C 572 and C 571 compare table for maximally halogen bulb voltage

A.C./D.C. RMS  
(Fluke 45)

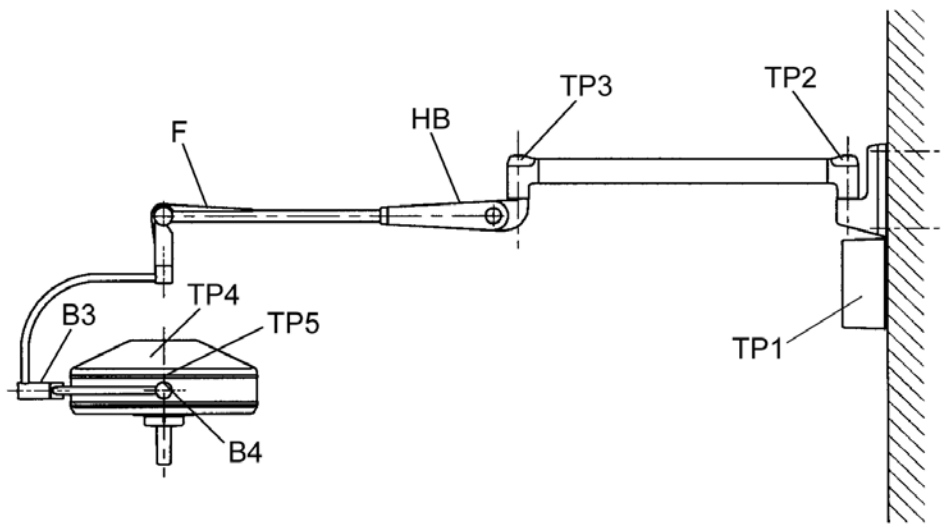
D.C. (Metrix RMS,  
Gossen RMS)

21,00 V	15,60 V
21,25 V	16,10 V
21,50 V	16,50 V
21,75 V	16,90 V
22,00 V	17,30 V
22,25 V	17,80 V
22,50 V	18,25 V
22,75 V	18,55 V
23,00 V	19,15 V
23,25 V	19,60 V
23,50 V	20,00 V
23,75 V	20,50 V
24,00 V	21,10 V

The halogen bulb is operated with a clocked constant voltage (square wave voltage) from the light regulation p.c. board. Therefore a voltmeter which is able to measure a real voltage for AC and DC parts at the same times is required (e. g. Fluke 45).

Max. adjustment level

## 9.6 CHROMOPHARE® C 452 and C 450 (classic cardanic)



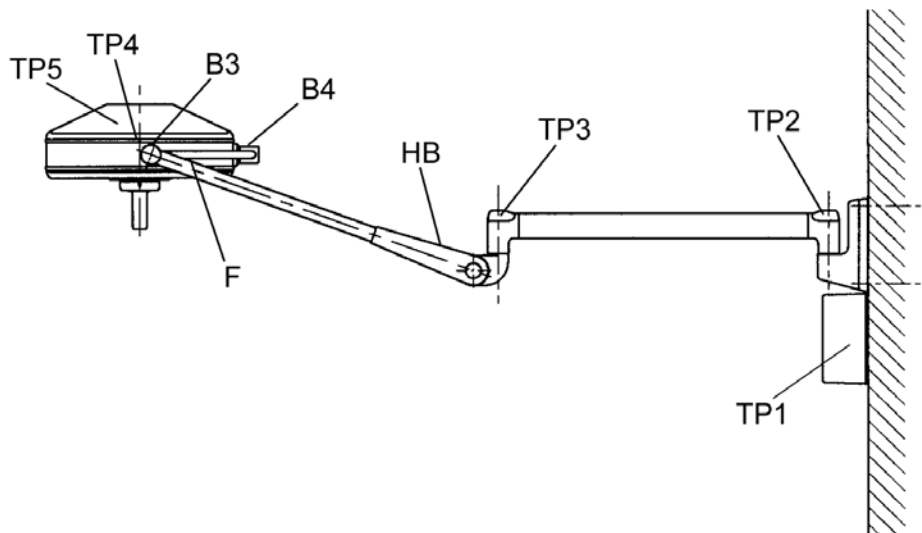
B Brake screw

TP Check points, see page 26

F Spring adjustment, see page 21

HB Height movement, see page 21

## 9.7 CHROMOPHARE® C 452 und C 450 (flat cardanic)



B Brake screw

TP Check points, see page 26

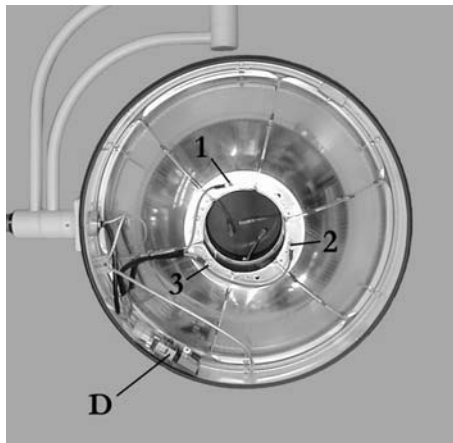
F Spring adjustment, see page 21

HB Height movement, see page 21

## 9.8 Check points CHROMOPHARE® C 452 and C 450

<b>TP1</b>	Terminal block transformer 25,5 V A.C. with load	<b>TP4</b>	Input plug connection X4/X5 24 V A.C. with load
<b>TP2</b>	Terminal block 25,1 V A.C. with load	<b>TP5</b>	main bulb (see page 26) between pin 1 and 2 24 V A.C. / D.C.
<b>TP3</b>	Sliding contact 27,3 V A.C. without load		reserve bulb (see page 26) between pin 2 and 3 24 V A.C. / D.C.

## 9.9 CHROMOPHARE® C 452 and C 450 localisation of the test point TP4 for measuring the bulb voltage



Pin 1 - 2 Main bulb

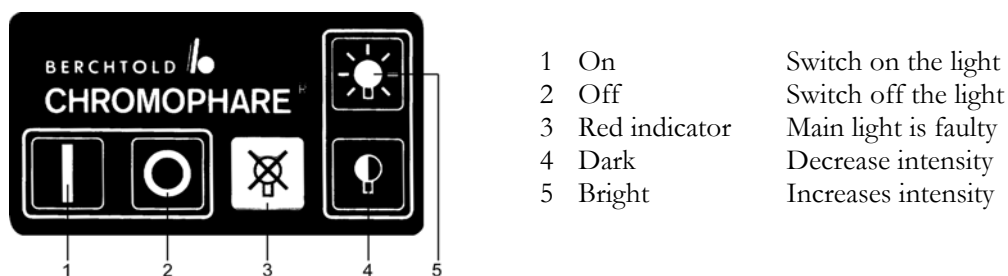
Pin 1 - 2 Reserve bulb

D Control board

## 10. OPERATION

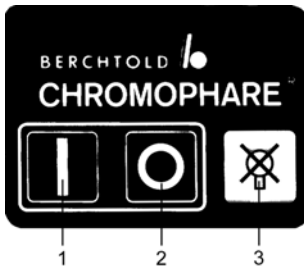
### 10.1 Control Panel and symbols

#### 10.1.1 CHROMOPHARE® C 572 and C 571



- 1 The OP light is switched on by pressing Key 1 (On)
- 2 The OP light is switched off by pressing Key 2 (Off)
- 3 By pressing and holding down Key 4 (Dark) the illuminance is continuously increased up to the maximum value. Repeated short presses increase the illuminance in steps.
- 4 By pressing and holding down Key 5 (Bright) the illuminance is continuously reduced down to the minimum value. Repeated short presses decrease the illuminance in steps.

### 10.1.2 CHROMOPHARE® C 452 and C 450



- |                 |                      |
|-----------------|----------------------|
| 1 On            | Switch on the light  |
| 2 Off           | Switch off the light |
| 3 Red indicator | Main light is faulty |

- 1 The OP light is switched on by pressing Key 1 (ON)
- 2 The OP light is switched off by pressing Key 2 (OFF)

## 10.2 Notes on operation

### 10.2.1 Adjusting the field size with the center hand grip

By turning the sterilizable handle the size of the light field is changed. By turning it in the clockwise direction the light field is enlarged, by turning anti-clockwise the light field is reduced. The surgeon must perform the optimum field setting himself in accordance with the size of the operation opening. There is an optimum contrast when the field size is set approx. 2 - 3 cm larger than the operation opening, so that the edge of the sterile covering is also illuminated. Thus the adaptation of the surgeon's eyes in the whole field of vision is improved.

### 10.2.2 Changing the sterilizable handles



By pressing the release button the handle is released and can be removed from the sleeve mounting. The new sterilized replacement sleeve is pushed onto the sleeve mounting until it touches the stop and is then turned in a clockwise direction until the sleeve locks into place.

## 10.3 Accessoires for CHROMOPHARE® C generation

### 10.3.1 Sterilizable handles

- Standard replacement sleeve Order no. CZ 498-02

*Note!*

*Each CHROMOPHARE® light system has sterilizable handles.*

*For directions about cleaning, disinfection and sterilization, see chapter 2.6 page 6.*

### 10.3.2 Halogen bulb (reserve halogen bulb)

#### 10.3.2.1 CHROMOPHARE® C 572 and C 571

- Halogen bulb 24 V/ 150 W

Order no. CZ 908-24

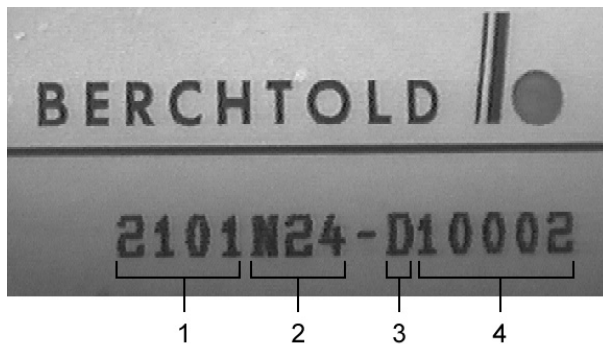
#### 10.3.2.2 CHROMOPHARE® C 452 and C 450

- Halogen bulb 22,8 V/ 110 W

Order no. CZ 905-22

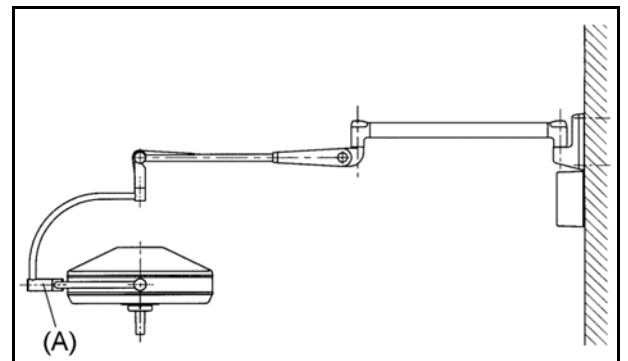
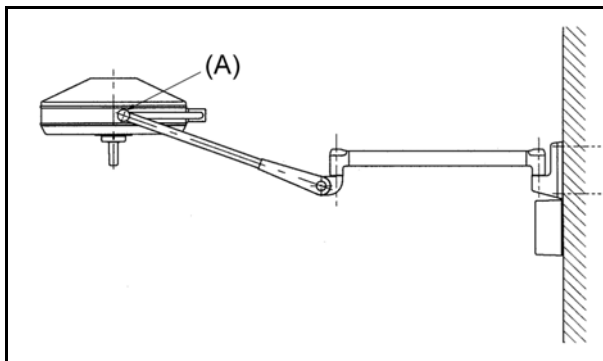
## 11. MAINTENANCE

### 11.1 Identification of the serial number



#### Type plate (A)

- 1 Version number
- 2 Variant
- 3 Manufacturing year
- 4 Serial number



The CHROMOPHARE® lights should be serviced once a year (maintenance contract). The Maintenance consist the steps as listed in the range of maintenance (capter 11.2, page 29). Maintenance may only be carried out by BERCHTOLD or by a company authorized by BERCHTOLD (see notes on product liability). Before performing any ordinary maintenance the lamp must be connected to the wall switch socket and switched off.

## 11.2 Range of maintenance

CHROMOPHARE® light .....	Serial no. ....		
	i.O.*	n.i.O.*	Eliminated
Check lamp on/off switch.			
Check maximum intensity of illumination at a distance of 1 m with small luminous field.			
Check maximum voltage of the bulb			
Adjustment of luminosity i.e. degrees of luminosity			
Lamp body: check that the hood support screws are properly tightened			
Lamp body: check the condition of the cable comb			
Commutation of the reserve bulbs			
Focussing system			
Diameter of the luminous body			
Brakes (clutch-type brakes)			
Tension of the support arm springs			
Support screws of the central positioning shaft / tighten the ceiling tube (min 23 Nm)			
Check the means of illumination i.e. the original BERCHTOLD halogen bulb (Voltage, Watts)			
Check the contacts of the bulb supports			
Check the power feed cables of the bulb supports			
Check the reflectors of the halogen bulbs			
Check the glass filter shields			
Check the collector ring and the strip contacts			
Eliminate or cover scratches and damage to the paintwork			
Check the closing mechanism of the replacement holders			
Rubber seals			
Measure the resistance of the security conductor (compliance with VDE standards)			
Check commutation to emergency current			

Edition 10/98 (replaces all previous editions)

\* i.O. = has been ordered      n.i.O. = not ordered

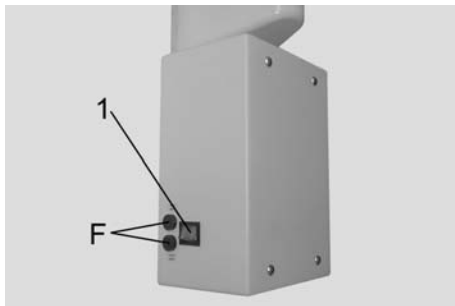
.....  
Date / Signature (Installation technician)

.....  
Date / Signature (Collaborator – Hospital)



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### 11.3 Notes on changing fuses



The mains fuses (F) for our light are installed in the transformer housing. For protection of the mains two fuses are installed in the case of mains voltage.

Mains switch (1)

	220 – 240 V		110 – 120 V	
Light	L F1 [A]	Batterie F2/F3 [A]	L F1 [A]	Batterie F2/F3 [A]
C 572 C 571	2	10	4	10
C 452 C 450	1	6,3	2	6,3
	All fuse slow blow			

### 11.4 Instructions for changing bulbs

The halogen bulb has an average life of 1000 hours. In the event of failure of the main lamp, switch over to a reserve lamp occurs automatically.

A red indicator lights up on the control panel when the lamp safety system has switched over to the reserve lamp. The defective main lamp should then be exchanged as quickly as possible.

The bulbs must be replaced in the following manner:



Switch off the lighting system and let it cool down (risk of burning).

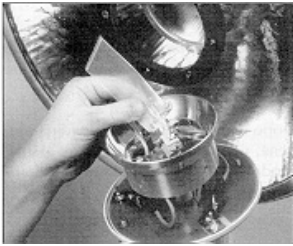
Release and remove sterilizable handle.

Unscrew the knurled screw on the underside of the light by turning anti-clockwise.



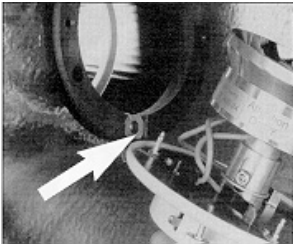
Pull out the whole light system at the hand grip.

Remove a faulty halogen lamp (the reserve lamp has an <R> marking on the base). We advise users to insert the reserve lamp into the main light lamp holder and to insert the new halogen lamp in the reserve lamp holder so that the reserve lamp does not become too worn.



Fit a new halogen bulb into the bulb holder, - for the booking reference number see chapter 10.3.2 halogen bulb on page 29 - ( do not touch the quartz cone of the halogen bulb with your bare fingers, use a cloth or soft paper.

During a lamp change check the bulb holder for scorch marks. If scorch marks are present, inform our service department.



Fit the light system back into the holder and screw up the knurled screws in a clockwise direction.

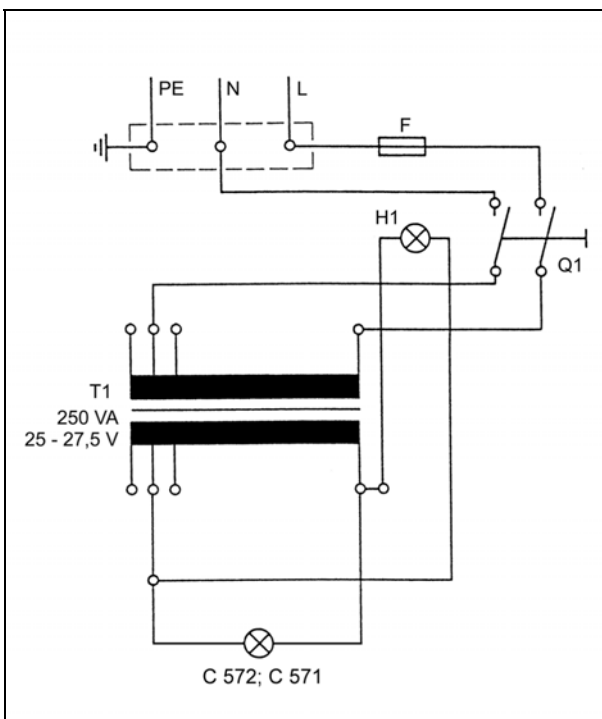
Switch the lighting system on and check that the lamp is on and the red indicator light is off.

**Note!**

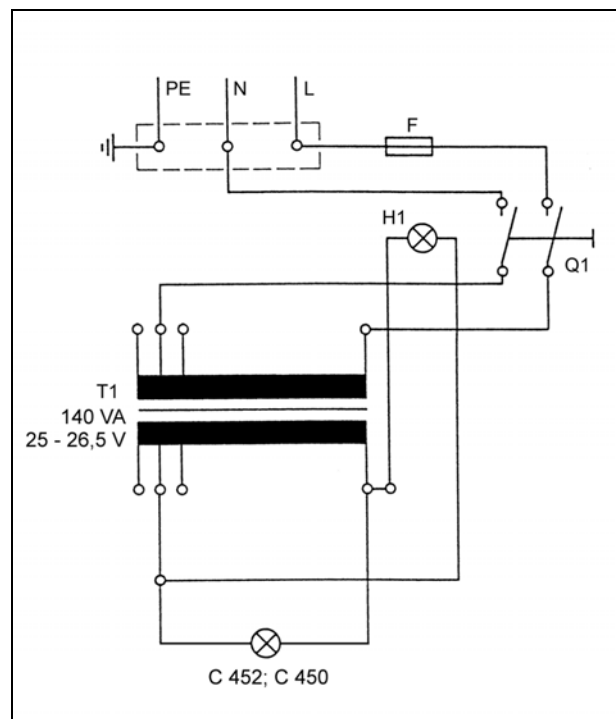
**Only use original BERCHTOLD halogen bulbs. If other bulbs are used, all guarantees regarding performance and operation will lapse.**

## 12. WIRING DIAGRAMS

### 12.1 CHROMOPHARE® C 572 and C 571



### 12.2 CHROMOPHARE® C 452 and C 450







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